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# UTILITY PATENT APPLICATION TRANSMITTAL (Small Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.  
546-P-8-USATotal Pages in this Submission  
59

## TO THE ASSISTANT COMMISSIONER FOR PATENTS

Box Patent Application  
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

TELESCOPING MAST WITH INTEGRAL PAYLOAD

and invented by:

Edward A. Marue and Kenneth J. Pereira

If a **CONTINUATION APPLICATION**, check appropriate box and supply the requisite information:☒ **Continuation** ☐ **Divisional** ☐ **Continuation-in-part (CIP)** of prior application No.: 09/283,843

Which is a: reissue application of U.S. Patent No. 5,615,855

☐ **Continuation** ☐ **Divisional** ☐ **Continuation-in-part (CIP)** of prior application No.:

Which is a:

☐ **Continuation** ☐ **Divisional** ☒ **Continuation-in-part (CIP)** of prior application No.: 08/072,817

Which is a: national stage application derived from PCT international application PCT/US92/08721.

Enclosed are:

## Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 19 pages and including the following:
  - a. ☒ Descriptive Title of the Invention
  - b. ☒ Cross References to Related Applications (if applicable)
  - c. ☐ Statement Regarding Federally-sponsored Research/Development (if applicable)
  - d. ☐ Reference to Microfiche Appendix (if applicable)
  - e. ☒ Background of the Invention
  - f. ☒ Brief Summary of the Invention
  - g. ☒ Brief Description of the Drawings (if drawings filed)
  - h. ☒ Detailed Description
  - i. ☒ Claim(s) as Classified Below
  - j. ☒ Abstract of the Disclosure

# UTILITY PATENT APPLICATION TRANSMITTAL (Small Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

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546-P-8-USA

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59

## Application Elements (Continued)

3. ☒ Drawing(s) (when necessary as prescribed by 35 USC 113)
- a. ☒ Formal      b. ☐ Informal      Number of Sheets 5
4. ☒ Oath or Declaration
- a. ☒ Newly executed (original or copy)      ☐ Unexecuted
- b. ☐ Copy from a prior application (37 CFR 1.63(d)) (for continuation/divisional application only)
- c. ☒ With Power of Attorney      ☐ Without Power of Attorney
- d. ☐ DELETION OF INVENTOR(S)  
Signed statement attached deleting inventor(s) named in the prior application,  
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference (usable if Box 4b is checked)  
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
6. ☐ Computer Program in Microfiche
7. ☐ Genetic Sequence Submission (if applicable, all must be included)
- a. ☐ Paper Copy
- b. ☐ Computer Readable Copy
- c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

## Accompanying Application Parts

8. ☒ Assignment Papers (cover sheet & documents)
9. ☐ 37 CFR 3.73(b) Statement (when there is an assignee)
10. ☐ English Translation Document (if applicable)
11. ☐ Information Disclosure Statement/PTO-1449      ☐ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Acknowledgment postcard
14. ☒ Certificate of Mailing
- ☐ First Class      ☒ Express Mail (Specify Label No.): EL094152775US

# UTILITY PATENT APPLICATION TRANSMITTAL (Small Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.  
546-P-8-USA

Total Pages in this Submission  
59

## Accompanying Application Parts (Continued)

15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)
16. ☒ Small Entity Statement(s) - Specify Number of Statements Submitted: 3
17. ☒ Additional Enclosures (please identify below):

Preexamination Communication

Terminal Disclaimer to Obviate a Double Patenting Rejection Over a Prior Patent

## Fee Calculation and Transmittal

### CLAIMS AS FILED

For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	17	- 20 =	0	x \$9.00	\$0.00
Indep. Claims	3	- 3 =	0	x \$39.00	\$0.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
BASIC FEE					\$345.00
OTHER FEE (specify purpose) _____					\$0.00
TOTAL FILING FEE					\$345.00

- ☒ A check in the amount of **\$345.00** to cover the filing fee is enclosed.
- ☐ The Commissioner is hereby authorized to charge and credit Deposit Account No. \_\_\_\_\_ as described below. A duplicate copy of this sheet is enclosed.
- ☐ Charge the amount of \_\_\_\_\_ as filing fee.
  - ☐ Credit any overpayment.
  - ☐ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
  - ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

Dated: June 19, 2000

  
Signature

David G. Duckworth  
Registration No. 39,516  
DRUMMOND & DUCKWORTH  
4590 MacArthur Blvd., Suite 500  
Newport Beach, California 92660

cc:

**CERTIFICATE OF MAILING BY "EXPRESS MAIL" (37 CFR 1.10)**Applicant(s): **Edward A. Marue and Kenneth J. Pereira**

Docket No.

**546-P-8-USA**

Serial No.

Filing Date

Examiner

Group Art Unit


DC781US PTO  
09/596850

06/19/00

Invention: **TELESCOPING MAST WITH INTEGRAL PAYLOAD**I hereby certify that this **Formal Drawings***(Identify type of correspondence)*

is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 in an envelope addressed to: The Commissioner of Patents and Trademarks, Washington, D.C.

20231-0001 on **June 19, 2000**  
*(Date)*

**Cortney Gollands***(Typed or Printed Name of Person Mailing Correspondence)*  
*(Signature of Person Mailing Correspondence)***EL094152775US***("Express Mail" Mailing Label Number)***Note: Each paper must have its own certificate of mailing.**

Applicants: Edward A. Marue and Kenneth J. Pereira

Attorney's Docket No.: 546-P-8-USA

Serial No:

Filed:

For: TELESCOPING MAST WITH INTEGRAL PAYLOAD

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS**  
**(37 CFR 1.9(f) AND 1.27(b)) - INDEPENDENT INVENTOR**

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled TELESCOPING MAST WITH INTEGRAL PAYLOAD described in

☒ the specification filed herewith.

☐ application serial no. \_\_\_\_\_, filed \_\_\_\_\_.

☐ patent no. \_\_\_\_\_, issued \_\_\_\_\_.

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below

☐ no such person, concern or organization

☒ person, concerns or organizations listed below\*

\*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME: The Will-Burt Company

ADDRESS: 169 S. Main Street, Box 900, Orrville, Ohio 44667-0900

☐ INDIVIDUAL      ☒ SMALL BUSINESS CONCERN      ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Date: 6/6/00

Edward A. Marue  
Edward A. Marue

Applicants: Edward A. Marue and Kenneth J. Pereira

Attorney's Docket No.: 546-P-8-USA

Serial No:

Filed:

For: TELESCOPING MAST WITH INTEGRAL PAYLOAD

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS**  
**(37 CFR 1.9(f) AND 1.27(b)) - INDEPENDENT INVENTOR**

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled TELESCOPING MAST WITH INTEGRAL PAYLOAD described in

☒ the specification filed herewith.

☐ application serial no. \_\_\_\_\_, filed \_\_\_\_\_.

☐ patent no. \_\_\_\_\_, issued \_\_\_\_\_.

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below

☐ no such person, concern or organization

☒ person, concerns or organizations listed below\*

\*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME: The Will-Burt Company

ADDRESS: 169 S. Main Street, Box 900, Orrville, Ohio 44667-0900


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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Date:

6-6-00

  
Kenneth J. Pereira



Applicants: Edward A. Marue and Kenneth J. Pereira

Attorney Docket No: 548-P-8-USA

Serial No:

Filed:

For: TELESCOPING MAST WITH INTEGRAL PAYLOAD

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS**  
**(37 CFR 1.9(f) AND 1.27(c)) - SMALL BUSINESS CONCERN**

I hereby declare that I am

☐ the owner of the small business concern identified below:

☒ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF ORGANIZATION: The Will-Burt Company

ADDRESS OF ORGANIZATION: 169 S. Main Street, Box 900, Orrville, Ohio 44667-0900

I hereby declare that the above identified small business concern qualified as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that the small business concern identified above qualifies as a small business concern as defined in 37 CFR 1.9(d) for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, with regard to the invention entitled: TELESCOPING MAST WITH INTEGRAL PAYLOAD, by inventors Edward A. Marue and Kenneth J. Pereira

described in:

☒ the specification filed herewith

☐ application serial no. \_\_\_\_\_, filed \_\_\_\_\_.

☐ patent no. \_\_\_\_\_, issued \_\_\_\_\_.

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below\* and no rights to the invention are held by any person, other than the inventor, who could not qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern that would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

\*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

NAME \_\_\_\_\_

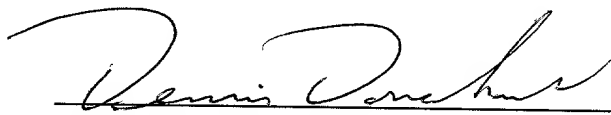
ADDRESS \_\_\_\_\_

☐ INDIVIDUAL    ☐ SMALL BUSINESS CONCERN    ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Date: 6/7/00

  
Dennis Donahue, CEO  
The Will-Burt Company  
169 S. Main Street, Box 900  
Orrville, Ohio 44667-0900

## TELESCOPING MAST WITH INTEGRAL PAYLOAD

This application is a Continuation application of reissue application Serial No. 09/283,843, filed March 31, 1999, which is, in turn, a reissue application of U.S. Patent No. 5,615,855, issued April 1, 1997, which is, in turn, a Continuation-in-Part  
5 of the USA application Serial No. 08/072,817, filed June 7, 1993, now U.S. Patent No. 5,593,129, issued January 14, 1997, which is a national-stage application derived from PCT international application PCT/US92/08721, filed October 6, 1992.

This invention relates to a telescoping mast which includes an integral payload.

More particularly, the invention pertains to an integrated telescoping mast-  
10 payload assembly which is specially adapted for mobile and portable use.

In another respect the invention relates to a telescoping mast-payload assembly which is specially configured for use under hazardous ambient conditions, in conjunction with protective shelters for operating personnel.

Telescoping masts have been widely employed for radio antennas, lights and a  
15 variety of other fixtures, such as instrumentation and telemetry packages for robotic vehicles, television cameras, mast-mounted antenna rotators, preamplifiers, radiation sensors and similar fragile electronic and electro-mechanical instrument packages.

Under extreme environmental conditions encountered during transport and use of portable telescoping masts which carry such fragile or environmentally sensitive packages, it would be highly desirable to provide improved mechanical, electrical and other forms of protection for the payload when the telescoping mast is retracted.

5      Additionally, since the nested mast height and, in turn, the operational deployed height are often critical operational parameters of a telescoping mast, it would be desirable to provide a telescoping mast-payload assembly which provides minimum nested, (fully retracted) height and in turn, maximum deployed, (fully extended) operational height.

10      Accordingly, the principal object of the present invention is to provide an improved telescoping mast-payload assembly.

Still another object of the invention is to provide such an assembly which has minimum nested height and maximum deployable height for a given number of telescoping mast sections.

15      Yet another object of the invention is to provide such an integrated telescoping mast-payload assembly which is specially adapted for mobile or portable use.

A further object of the invention is to provide an integrated mast-payload assembly which protects the payload during storage and transportation while the mast is fully retracted.

A still further object of the invention is to provide an integrated mast-payload assembly which obviates the need to remove and reinstall the payload during transportation and in which there is no need for human interaction with the assembly to install or remove a payload during storage transportation or use.

5           This and other, further and more specific objects of the invention will be apparent to those skilled in the art from the following detailed description, taken in conjunction with the drawings in which:

Fig. 1 is a perspective view of an integrated telescoping mast-payload assembly which embodies the present invention;

10           Fig. 2 is a cross-sectional view of the assembly of Fig. 1 taken along section 2-2 thereof;

Fig. 3 is a perspective cut-away view of the cable stowage-dispensing assembly of the embodiment of Figs. 1-2;

15           Figs. 4a-4c are, respectively, cut-away views of the radiating antenna element of the assembly of Figs. 1-3, cross-sectional views thereof (along section line 4-4 of Fig. 4a) and the upper end view thereof;

Fig. 5. depicts the assembly of Figs. 1-4, mounted externally on an operational vehicle, e.g., on the SICPS shelter of an HMMWV/CUCV transporter;

Fig. 6 depicts an alternate mobile installation of the assembly of 1-4, e.g., in the antenna mast cavity of a C2V Bradley vehicle;

5 Fig. 7 is a perspective view of another embodiment of the integrated telescoping mast-payload assembly of the present invention, in which the payload package does not have a central axial aperture, in which the mast sections have a polygonal cross-section and which utilizes multiple axial drive screws, and in which a cable assemble is enclosed internally of the mast and protected thereby;

10 Fig. 8 is a sectional view of the assembly of Fig. 7 in the fully retracted (nested) condition, taken along section line 8-8 of Fig. 9;

Fig. 9 is a side view of the assembly of Figs. 7-8, with the mast fully retracted;

Fig. 10 is a sectional view of the assembly of Figs. 8-9 taken along section line 10-10 thereof;

15 Fig. 11 is a cut-away rear view depicting a mast-payload assembly of Figs. 7-10, mounted in the antenna mast cavity of a vehicle such as the Bradley C2V;

Briefly, in accordance with the broadest aspects of the invention, I provide an integrated telescoping mast-payload assembly comprising at least two or more nesting, telescoping mast sections, each section having an upper end and a lower end. The telescoping sections include one or more lower sections and a top section which is dimensioned to slidably nest within the next-lower section. Means are provided for extending and retracting the top section relative to the next-lower section and each of the lower sections relative to the section next below (except for the bottom section). A payload forms at least the upper end of the top section and at least a portion of the payload is received within the next-lower section when the top section is fully retracted. The lower section or sections provide protection for the payload when the top section is fully retracted.

According to a preferred embodiment, the assembly is mounted upon or in a vehicle or upon or in a transportable shelter.

In another presently preferred embodiment, the payload is an antenna for transmitting and/or receiving electro-magnetic energy such as radio signals.

In yet another preferred embodiment, one or more of the lower sections is radiopaque to shield the payload from stray electro-magnetic radiation, particularly EMP, when the assembly is retracted.

According to the best mode contemplated at present, the integrated mast-payload assembly includes means for mechanical locking the upper and lower sections together when the upper section is fully extended and when it is fully retracted, but preventing relative sequentially movement between the sections when the upper section is between the fully retracted and fully extended positions.

In another preferred embodiment of the invention, when the nature of the payload prevents forming it with a central longitudinal parameter, a plurality of axial drive screws (at least two), are employed and these drive screws are laterally spaced from the longitudinal center line of the telescoping mast sections.

The drawings are provided to further illustrate to those skilled in the art how to make and use the invention and are not intended as a limitation on the scope of the invention. In the drawings, like reference characters identify the same elements in the several views.

Referring to Figs. 1-3, the telescoping mast-payload assembly, generally indicated by reference numeral 10 includes a bottom mast section 11, a top mast section 12 and one or more lower sections 13-19. Each of the mast sections 12-19 is dimensioned to be slidably received within the next-lower section. The top section 12 and each of the one or more lower sections 13-19 can be extended and retracted relative to the next lower section from a fully retracted position, as shown in Figs. 1-2 to a



fully extended position (not shown). A single axial drive screw 21, which is rotated by operation of an electric motor 22 which transmits rotational force through a drive train 23, engages nuts 24 carried internally at the bottom end of each of the mast sections 12-19. Rotation of the axial drive screw 21 causes upward or downward movement of the nuts 24 on the drive screw 21 and corresponding relative motion of the mast section associated with each of the nuts 24. Holddown locking mechanisms 25 are provided to cause sequential deployment and retraction of each of the mast sections 12-19, to lock adjacent sections together when the mast is fully nested and when each section is fully extended relative to its next-lower section. A cable stowage/dispensing sub-assembly 31 includes an elongate frame 32, a moveable multi-sheave pulley 33 and a spring 34 connected to the pulley 33 which urges the pulley 33 downwardly in the direction of the arrow A. The transmission line cable 35 is connected at its upper end to the connector portion 36 of a antenna element 37 which forms the hollow antenna element which forms the upper section of the telescoping assembly 10. The transmission line passes into the frame 32 forming windings 38 on the moveable pulley 33 and stationary pulley 39. A terminal portion 41 of the cable 35 is fixed by means of a hook 42 to the frame 32 and passes through an outlet aperture 43 to its point of connection with another component, e.g., radio transceiver, (not shown). Further details of the operation of the drive components 21-24, the locking devices 25 and the cable stowage/dispensing assembly 32 are disclosed in the published international application No. PCT/US92/08721 (International Publication Number WO 93/07395, published 15 April, 1993), which is incorporated herein by reference.

Figs. 4a-4c depict the top section 12 of the telescoping mast of Figs. 1-3, the major length thereof being formed as a hollow cylinder 42 having a longitudinal bore 42. At the lower end 43 the diameter of the bore 42 is increased to provide a socket 44 which receives a nut which engages threads on the axial drive screw 21. The annular shoulder 45 cooperates with the locking mechanism on the upper end of mast section 13, in the manner previously described, a key 46 is formed as a longitudinal shoulder on the outer surface of the cylindrical section 41 to prevent rotation of the upper section 12. The upper end 47 of the top section 12 is provided with a coaxial connector 48 for attaching to rf transmission cable 35 with the rf rotated/receiving components which are embedded into side walls 49 of the top section 12.

Fig. 5 depicts the integrated mast-payload assembly 10 of Figs. 1-4, mounted externally on the rear wall 51 of an SICPS shelter 52 carried on a suitable vehicle, e.g., the HMMWV/CUCV transporter. Alternatively, as depicted in Fig. 6, the assembly 10 can be mounted within a special radio antenna enclosure, indicated by the dash lines 61 of an enclosed vehicle such as the Bradley C2V. In either case, the electrical power lines, and control cables for the drive mechanism 22 and the coaxial cable 35 are routed through the bulkheads 51 (Fig. 5) or 63 (Fig. 6) to the interior of the vehicle, which protectively houses the human operators, such that the mast and payload can be extended and retracted from within vehicles 52, 62, without requiring personnel to operate outside these shelters.

Another embodiment of the invention is depicted in Figs. 7-11. This embodiment is useful when the character of the payload does not permit it to be formed as a hollow cylinder (as shown in Fig. 4).

As shown in Figs. 7-11, a complex payload such as the J-STARS SCDL antenna 71 is operatively mounted on a base 72. The antenna 71 and base 72 form the upper section 73 of a multi-section telescoping mast comprising a plurality of intermediate lower sections 73 and a bottom section 74, each of the sections 72-74 are formed of aluminum frame members 75, covered and stiffened by graphite composite panels 76. Alternatively, panels 76 can be omitted, thereby reducing the wind load on the mast. The extended assembly of Fig. 7 is shown in cross-section in Figs. 8 and 10 and in a side view in Fig. 9. In the embodiment of Fig. 7-9, the antenna cable 35 is preformed as an extensible coil 77. Power to extend and retract the assembly is provided by an electric motor 78 and associated drive mechanism 79. As shown in Fig. 11, the assembly of Figs. 7-10 can also be mounted internally of a radio antenna well 91 formed in an appropriate vehicle such as the C2V Bradley.

Having described the invention in such terms as to enable those skilled in the art to make and use it and having identified the presently known and preferred best modes thereof, I claim:

1. A telescoping mast-payload assembly for reducing the retracted height of a mast-payload assembly and for providing protection of a payload when said mast-payload assembly is retracted, said mast-payload assembly comprising:

(a) a telescoping mast component extending and retracting along the mast's longitudinal axis defining a mast axis, said telescoping mast component comprising:

a telescoping mast, adapted to telescope upwardly along said mast axis to an extended position and to telescope downwardly along said mast axis to a retracted position, said telescoping mast comprising:

a fixed bottom section being shaped and dimensioned to include a hollow region for telescopically receiving a next higher mast section;

a plurality of extending and retracting non-payload carrying intermediate mast sections, each section having upper and lower ends and being shaped and dimensioned to include a hollow region for telescopically receiving the next higher mast section; and

an extending and retracting payload section shaped and dimensioned to be telescopically received within the hollow region of the uppermost section of said intermediate sections;

5           said intermediate support sections and said payload section being constructed to telescopically retract along said mast axis within the hollow region of the next lower mast section and to telescopically extend along said mast axis above the next lower mast section, said plurality of intermediate support sections supporting said payload section when said mast is extended to said extended position and receiving and  
10           protecting said payload section when said mast is retracted to said retracted position; and

(b)       a payload component of said assembly forming at least a portion of said payload section, and being shaped and dimensioned to extend along said mast axis to be supported above the next-lower support section when  
15           said mast-payload assembly is extended to said extended position and to retract along said mast axis and to be at least partially received and protected within said non-payload carrying intermediate support sections when said mast is in retracted to said retracted position.

2. The telescoping mast-payload assembly of Claim 1 wherein the payload is a member of the group consisting of radio antennas, lights, television cameras, antenna rotators, preamplifiers, radiation sensors, instrumentation and telemetry packages for robotic vehicles, and electronic and electro-mechanical instrument packages.

3. The telescoping mast-payload assembly of Claim 1 wherein the payload is a radio antenna.

4. The telescoping mast-payload assembly of Claim 1 being mounted on a vehicle.

5. The telescoping mast-payload assembly of Claim 3 being mounted on a vehicle.

6. The telescoping mast-payload assembly of Claim 1, further including motor drive means for extending and retracting said payload section and said intermediate support sections relative to said bottom section.

7. A telescoping mast-payload assembly for reducing the retracted height of a mast-payload assembly and for providing protection of a payload when said mast-payload assembly is retracted, said mast-payload assembly comprising:

- 5 (a) a telescoping mast component extending and retracting along the mast's longitudinal axis defining a mast axis, said telescoping mast component comprising:

10 a telescoping mast, adapted to telescope upwardly along said mast axis to an extended position and to telescope downwardly along said mast axis to a retracted position, said telescoping mast comprising:

a fixed bottom section being shaped and dimensioned to include a hollow region for telescopically receiving a next higher mast section;

15 a plurality of extending and retracting non-payload carrying intermediate mast sections, each section having upper and lower ends and being shaped and dimensioned to include a hollow region for telescopically receiving the next higher mast section; and

an extending and retracting payload section shaped and dimensioned to be telescopically received within the hollow region of the uppermost section of said intermediate sections;

5           said intermediate support sections and said payload section being constructed to telescopically retract along said mast axis within the hollow region of the next lower mast section and to telescopically extend along said mast axis above the next lower mast section, said plurality of intermediate support sections supporting said payload section when said mast is extended to said extended position and receiving and  
10           protecting said payload section when said mast is retracted to said retracted position;

(b)       a payload component of said assembly forming at least a portion of said payload section, and being shaped and dimensioned to extend along said mast axis to be supported above the next-lower support section, when said mast-payload assembly is extended to said extended position and to  
15           retract along said mast axis and to be at least partially received and protected within said non-payload carrying intermediate support sections when said mast is in retracted to said retracted position; and

(c)       motor drive means for extending and retracting said payload section and said intermediate support sections relative to said bottom section.



8. The telescoping mast-payload assembly of Claim 7 wherein the payload is a member of the group consisting of radio antennas, lights, television cameras, antenna rotators, preamplifiers, radiation sensors, instrumentation and telemetry packages for robotic vehicles, and electronic and electro-mechanical instrument packages.

9. The telescoping mast-payload assembly of Claim 7 wherein the payload is a radio antennae.

10. The telescoping mast-payload assembly of Claim 8 being mounted on a vehicle.

11. The telescoping mast-payload assembly of Claim 9 being mounted on a vehicle.

12. The telescoping mast-payload assembly of Claim 7 further comprising:  
a transmission line cable for transmitting a signal to or from said payload; and  
a subassembly for stowing and dispensing said cable when said mast assembly is retracted and extended.

13. A vehicular mounted telescoping mast-payload assembly for reducing the retracted height of a mast-payload assembly and for providing protection of a payload when said mast-payload assembly is retracted, said mast-payload assembly comprising:

- (a) a telescoping mast component extending and retracting along the mast's longitudinal axis defining a mast axis, said telescoping mast component comprising:

a telescoping mast, adapted to telescope upwardly along said mast axis to an extended position and to telescope downwardly along said mast axis to a retracted position, said mast comprising:

a fixed bottom section being shaped and dimensioned to include a hollow region for telescopically receiving a next higher mast section;

an extending and retracting non-payload carrying intermediate mast section, said section having an upper and lower end and being shaped and dimensioned to include a hollow region for telescopically receiving a next higher mast section; and

an extending and retracting payload section shaped and dimensioned to be telescopically received within the hollow region of said intermediate section;

said intermediate support sections and said payload section being constructed to telescopically retract along said mast axis within the hollow region of the next lower mast section and to telescopically extend along said mast axis above the next lower mast section, said intermediate support section supporting said payload section when said mast is extended to said extended position and receiving and protecting said payload section when said mast is retracted to said retracted position;

- (b) a payload component of said assembly forming at least a portion of said payload section, and being shaped and dimensioned to extend along said mast axis to be supported above the next-lower support section when said mast-payload assembly is extended to said extended position and to retract along said mast axis and to be at least partially received and protected within said non-payload carrying intermediate support section when said mast is retracted in said retracted position; and

- (c) attachment means for attaching said bottom section to a vehicle.

14. The telescoping mast-payload assembly of Claim 13 wherein the payload is a member of the group consisting of radio antennas, lights, television cameras, antenna rotators, preamplifiers, radiation sensors, instrumentation and telemetry packages for robotic vehicles, and electronic and electro-mechanical instrument packages.

15. The telescoping mast-payload assembly of Claim 13 wherein the payload is a radio antennae.

16. The telescoping mast-payload assembly of Claim 14 further comprising:  
a transmission line cable for transmitting a signal to or from said payload; and  
a subassembly for stowing and dispensing said cable when said mast assembly is retracted and extended.

17. The telescoping mast-payload assembly of Claim 13, further including motor drive means for extending and retracting said payload section and said intermediate support sections relative to said bottom section.



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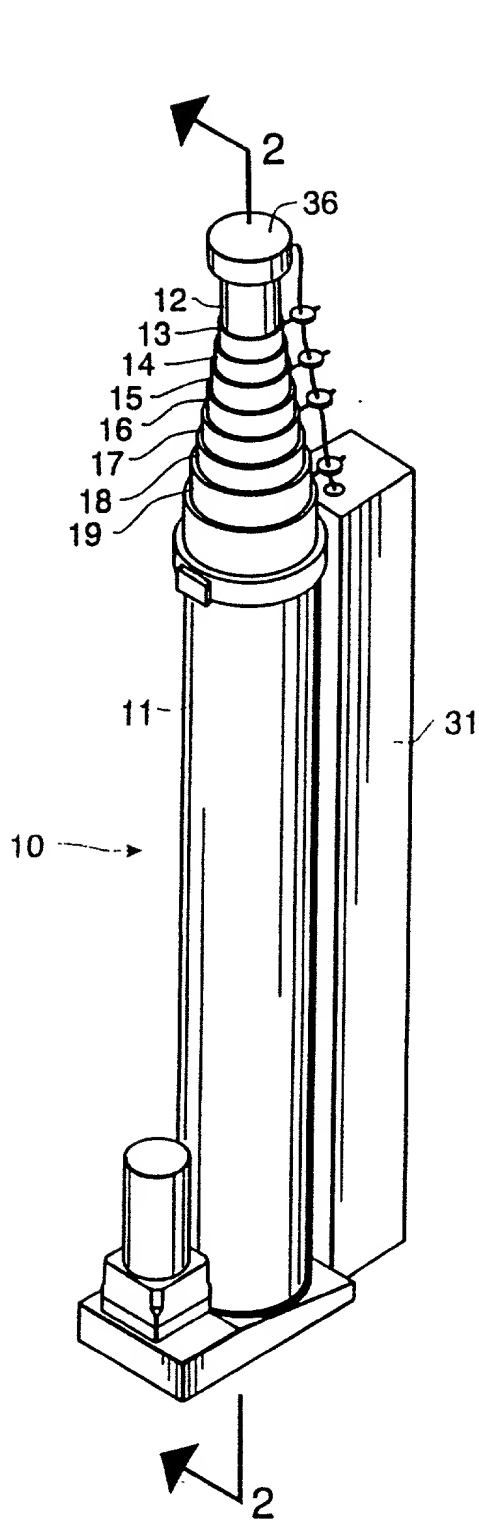


FIG. 1

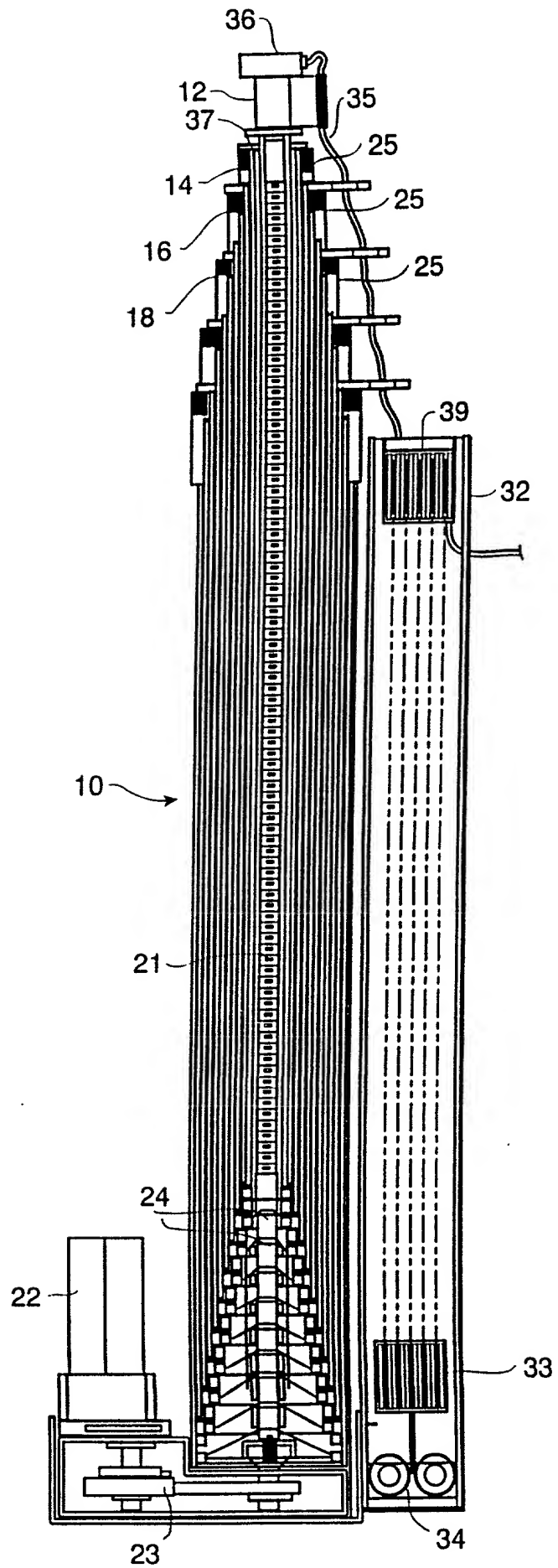
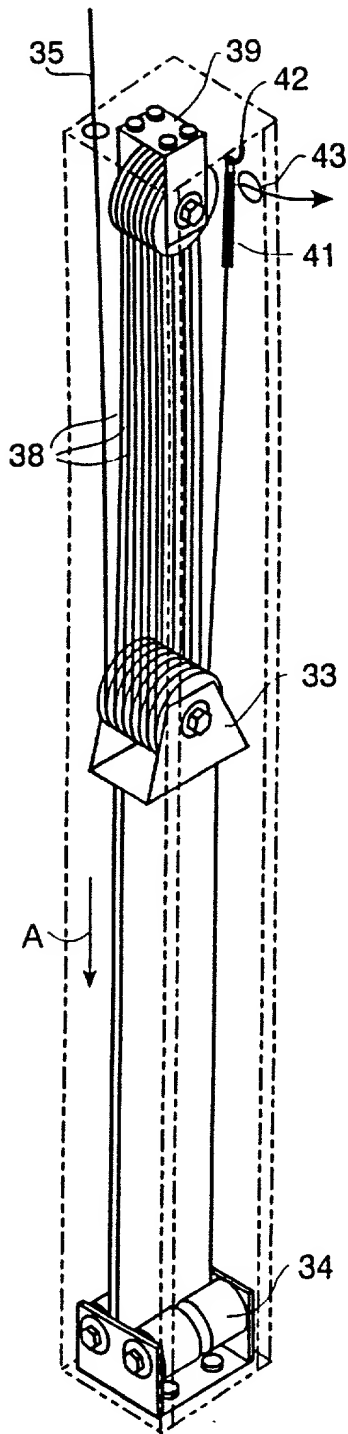
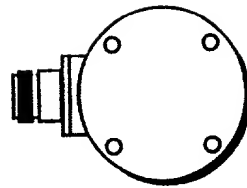


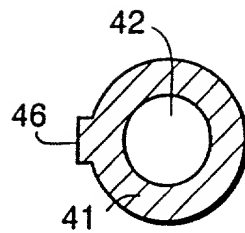
FIG. 2



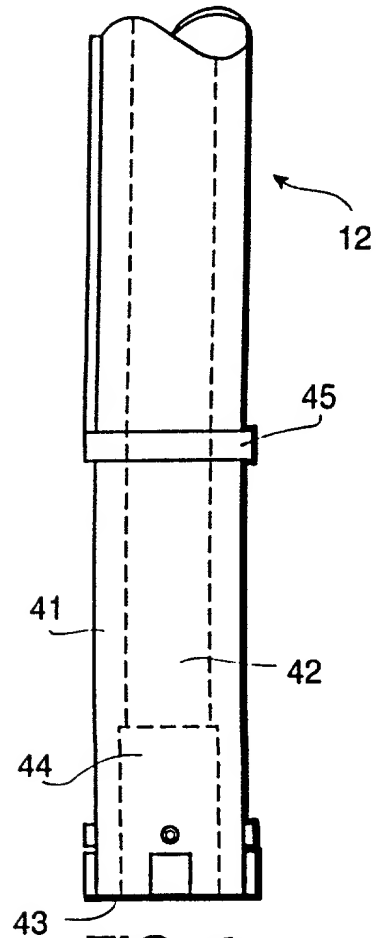
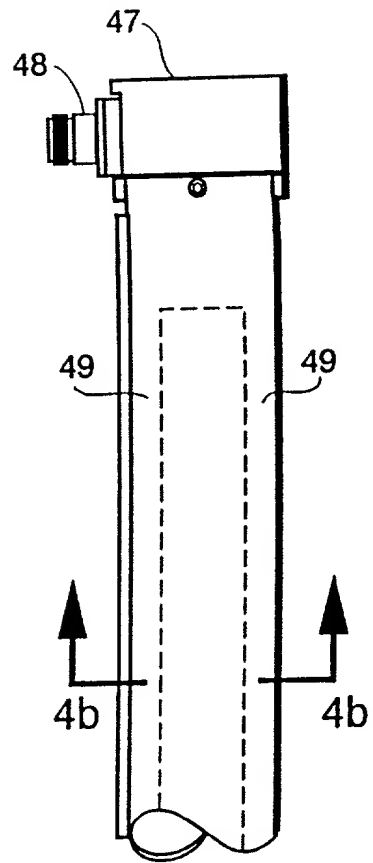
**FIG. 3**



**FIG. 4c**



**FIG. 4b**



**FIG. 4a**

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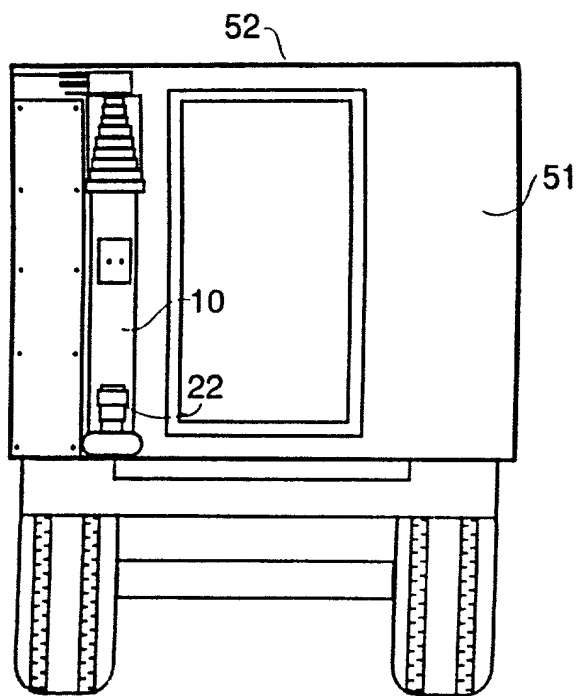


FIG. 5

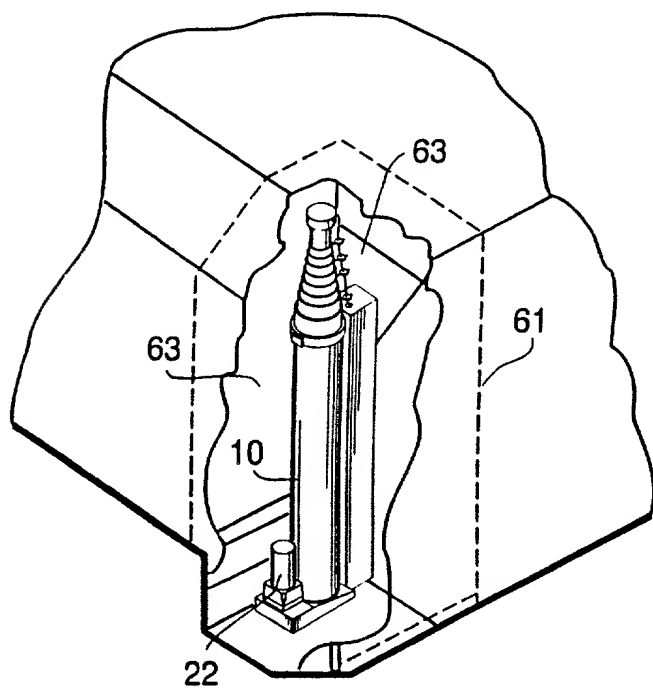


FIG. 6

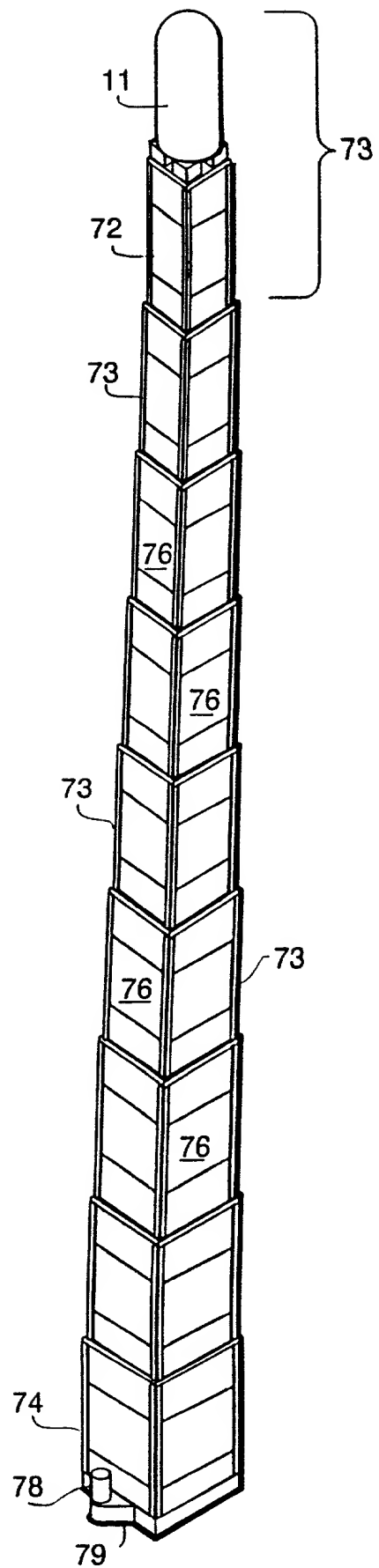
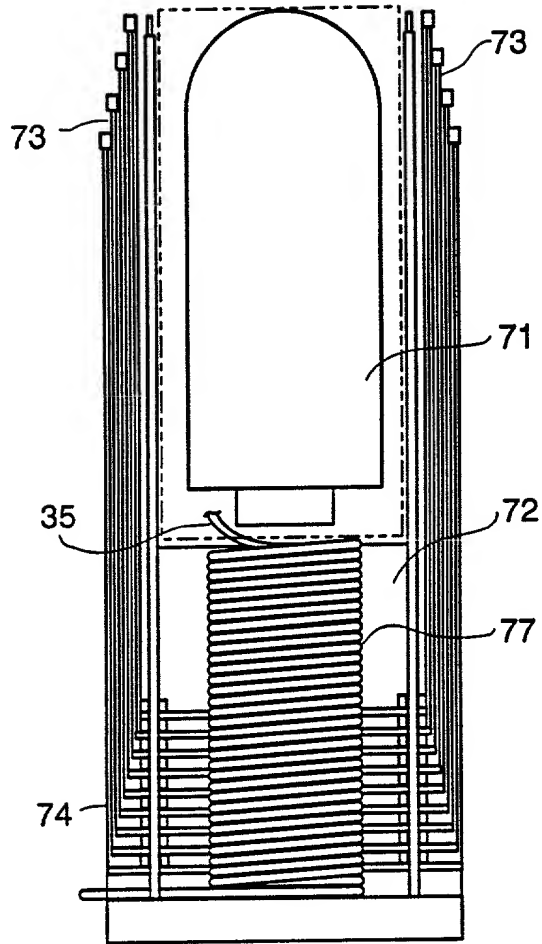
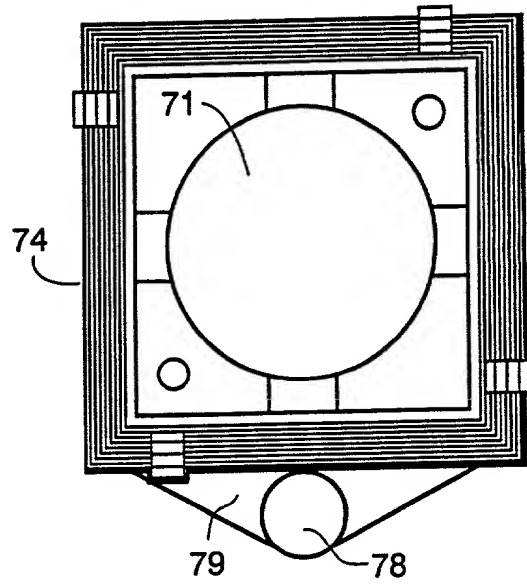


FIG. 7

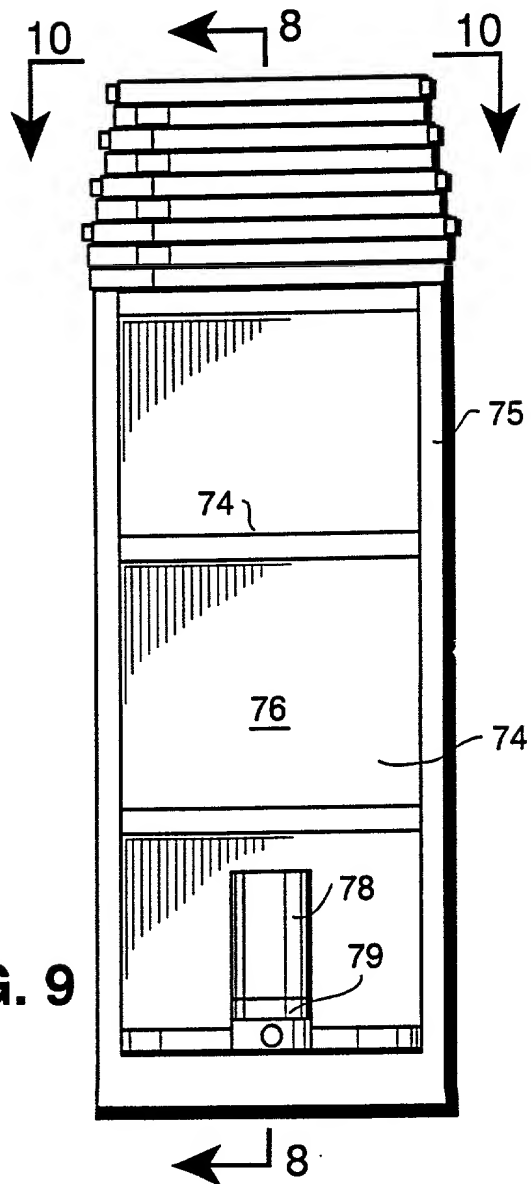




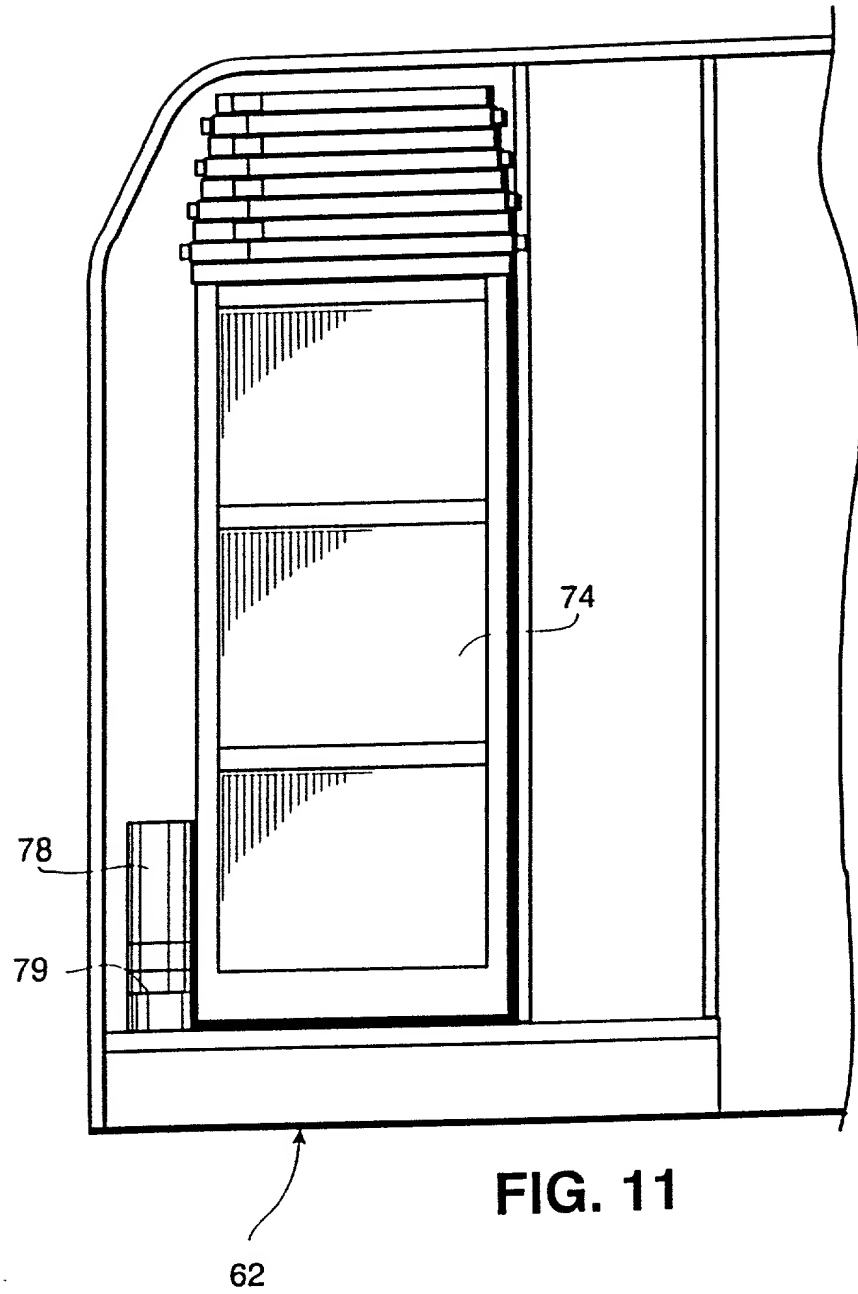
**FIG. 8**



**FIG. 10**



**FIG. 9**



**UTILITY PATENT APPLICATION DECLARATION AND POWER OF ATTORNEY**

As a below named inventor, I hereby declare that:

My residence, post office and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter claimed and for which a patent is sought on the invention entitled TELESCOPING MAST WITH INTEGRAL PAYLOAD, the specification of which

[X] is attached hereto [ ] was filed on \_\_\_\_\_ as Application Serial No. \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information that is known to me to be material to patentability in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

<b>Prior Foreign Application(s):</b>			<b>Priority Claimed</b>	
<b><u>Number</u></b>	<b><u>Country</u></b>	<b><u>Day/Month/Year Filed</u></b>	<b><u>Yes</u></b>	<b><u>No</u></b>
PCT/US92/08721	PCT	6/10/92	X	

I hereby claim the benefit under Title 35, United States Code, Section 119 of United States provisional application(s), and/or Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) that occurred between the filing date of the prior application and the national or PCT international filing date of this application:

<b>Prior U.S. Application(s):</b>		<b><u>Status: Patented, Pending, Abandoned</u></b>
<b><u>Serial No.</u></b>	<b><u>Filing Date</u></b>	
09/283,843	March 31, 1999	Pending
5,615,855	April 1, 1997	Patented
08/072,817	June 7, 1993	Patented

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint the following attorney(s) and/or agent(s):

William H. Drummond, Registration No. 20,590

David G. Duckworth, Registration No. 39,516

all of

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4590 MacArthur Boulevard, Suite 500

Newport Beach, California 92660

with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and all future correspondence should be addressed to them.

\*\*\*\*\*

Full name of first inventor: Edward A. Marue

Inventor's signature: Edward A. Marue Date: 6/6/00

Residence: 7570 N. Calle Sin Controversia, Tucson, Arizona 85718

Citizenship: U.S.A.

Post office address: Same as above.

\*\*\*\*\*

Full name of second inventor: Kenneth J. Pereira

Inventor's signature: \_\_\_\_\_ Date: \_\_\_\_\_

Residence: 1581 18<sup>th</sup> Avenue, Kingsburg, California 93631

Citizenship: U.S.A.

Post office address: Same as above.

\*\*\*\*\*

**UTILITY PATENT APPLICATION DECLARATION AND POWER OF ATTORNEY**

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I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter claimed and for which a patent is sought on the invention entitled TELESCOPING MAST WITH INTEGRAL PAYLOAD, the specification of which

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<u>Number</u>	<u>Country</u>	<u>Day/Month/Year Filed</u>	<u>Priority Claimed</u>
			<u>Yes</u> <u>No</u>
PCT/US92/08721	PCT	6/10/92	X

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I hereby appoint the following attorney(s) and/or agent(s):

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all of

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Citizenship: U.S.A.

Post office address: Same as above.

\*\*\*\*\*

Full name of second inventor: Kenneth J. Pereira

Inventor's signature:

Date: 6-6-00

Residence: 1581 18<sup>th</sup> Avenue, Kingsburg, California 93631

Citizenship: U.S.A.

Post office address: Same as above.

\*\*\*\*\*